Section XXI

MECHANICAL SPECIFICATIONS AND ADJUSTMENTS

55th SERIES

MODELS	CLIPPER DELUXE—CLIPPER SUPER	CLIPPER CUSTOM	PACKARD
CHASSIS SYMBOLS	5540	5560	5580

BRAKES

Type	Hydraulic—2-Shoe	Hydraulic—2-Shoe	Hydraulic—2-Shoe
Effective Area	191.8 sq. in.	191.8 sq. in.	208.25 sq. in.
Effective Area Hand Brake	85.25 sq. in.	85.25 sq. in.	98.0 sq. in.
Drum Diameter			
Front	11" Centrifuse	11" Centrifuse	12" Centrifuse
Rear	11" Centrifuse	11" Centrifuse	12" Centrifuse
Lining Size and Material			
Primary Shoes			
Front	9 5/16" x 2 1/2" x 3/16"	9 5/16" x 2 1/2" x 3/16"	11 1/2" x 2 1/4" x 3/16"
Rear	9 5/16" x 2" x 3/16"	9 5/16" x 2" x 3/16"	11 1/2" x 2" x 3/16"
Material	Marshall—4112	Marshall—4112	Marshall—4112
Secondary Shoes			
Front	12" x 2 1/2" x 3/16"	12" x 2 1/2" x 3/16"	13" x 2 1/4" x 3/16"
Rear	12" x 2" x 3/16"	12" x 2" x 3/16"	13" x 2" x 3/16"
Material	Marshall—9051	Marshall—9051	Marshall—9051
Wheel Cylinder Size			
Front	1 1/8" Dia.	1 1/8" Dia.	1 1/8" Dia.
Rear	1 1/16" Dia.	1 1/16" Dia.	1" Dia.
Master Cylinder Size	1" Dia.	1" Dia.	1" Dia.
Brake (Power Unit)	Sp. Equip.	Sp. Equip.	Sp. Equip. Std. Equip. (5588)

CLUTCH

Type	Single Dry Plate	Single Dry Plate
Pedal Free Play	1 1/4" to 1 1/2"	1 1/4" to 1 1/2"
Facing Material	Woven Asbestos	Woven Asbestos
Size of Facing	7" x 10 1/2" x .125"	7" x 11" x .125"
Throw Out Bearing	Prelubricated Ball	Prelubricated Ball
Clutch Spring Pressure (Total)	1467 lbs.	1467 lbs.
Number of Springs	8	8
Vibration Neutralizer	Yes	Yes

COOLING SYSTEM

Type	Pressure	Pressure	Pressure
Water Pump	Centrifugal Self-Adjusting	Centrifugal Self-Adjusting	Centrifugal Self-Adjusting
Water Pump Drive	Fan Belt	Fan Belt	Fan Belt
Capacity of System	26 qts.	26 qts.	26 qts.
Heater Capacity			
(One)	1/2 qt.	1/2 qt.	
(Two)	1 qt.	1 qt.	1 qt.
Fan	4 Blade—19 7/8" Dia.	4 Blade—19 7/8" Dia.	4 Blade—19 7/8" Dia.
Drive Pulley	On Crankshaft	On Crankshaft	On Crankshaft
Ratio	.92 to 1	.92 to 1	.92 to 1
Thermostat Starts to Open			
Standard	167° to 173°	167° to 173°	167° to 173°
High Reading	177° to 182°	177° to 182°	177° to 182°
Fan Belt	56 11/16" x 3/8"	56 11/16" x 3/8"	56 11/16" x 3/8"
Fan Belt Adjustment	At Generator	At Generator	At Generator
Heat Indicator	Electric	Electric	Electric
Gravity Flow of Radiator (Minimum)	30 Gal. per Min.	32 1/2 Gal. per Min.	32 1/2 Gal. per Min.
Radiator Cap	Pressure Type—12 psi	Pressure Type—12 psi	Pressure Type—12 psi

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ELECTRICAL

Battery

Make and Type	Auto-Lite 3EA-60-R3 Willard HDW-3KM-60	Auto-Lite 3EA-60-R3 Willard HDW-3KM-60	Auto-Lite 3EA-60-R3 Willard HDW-3KM-60
Capacity	60 Ampere Hour	60 Ampere Hour	60 Ampere Hour
Number of Plates	9	9	9
Terminal Grounded	Positive	Positive	Positive

Starting Motor

Make and Type	Auto-Lite MDD6301	Delco-Remy 1107635	Delco-Remy 1107635
Starter Drive	Bendix	Solenoid Actuated Shift	Solenoid Actuated Shift
Number of Flywheel Teeth	182	182	182
Number of Teeth in Starter—Pinion	9	9	9
Pinion Meshes	From Front	From Front	From Front
Current Draw—Free Running	60 Amps. @ 10.0 Volts	95 Amps. @ 10.1 Volts	95 Amps. @ 10.1 Volts
Current Draw— Cranking Engine (70° F.)	200-225 Amps.	200-225 Amps.	200-225 Amps.
Brush Spring Tension	42 oz.	35 oz.	35 oz.

Generator

Make and Type	Auto-Lite GJC-6001A	Delco-Remy 1102022	Delco-Remy 1102022
Generator Drive	Belt	Belt	Belt
Generator Cut In Speed—Hot	1325 R.P.M.	1250 R.P.M.	1250 R.P.M.
Generator Output	30 Amps.	30 Amps.	30 Amps.
Field Current—Amps.		1.48-1.62 @ 12 Volts	1.48-1.62 @ 12 Volts
Brush Spring Tension	35 oz.	28 oz.	28 oz.

Regulator

Make and Type	Auto-Lite VRX-6007A	Delco-Remy 1118953	Delco-Remy 1118953
Maximum Output	30 Amps.	30 Amps.	30 Amps.
Circuit Breaker			
Air Gap	.031″—.034″	.020″	.020″
Contact Gap	.015″	.020″	.020″
Close Volts	13.0 to 13.75	11.8 to 13.5	11.8 to 13.5
Current Regulator			
Air Gap	.048″—.052″	.075″	.075″
Contact Gap	.012″	.012″	.012″
Amperes	30	30	30
Voltage Regulator			
Air Gap	.048″—.052″	.075″	.075″
Contact Gap	.012″	.012″	.012″
Voltage (70° F.)	14.25—14.75 (ADJ. 14.5)	13.8—14.8 (ADJ. 14.5)	13.8—14.8 (ADJ. 14.5)

Distributor

Make and Type	Auto-Lite IBJ-4001	Delco-Remy 1110854	Delco-Remy 1110854
Ignition Timing	5° BTDC	5° BTDC	5° BTDC
Breaker Point Gap (Initial Setting)	.016″	.016″	.016″
Breaker Arm Spring Tension	17—20 oz.	19—23 oz.	19—23 oz.
Spark Control	Full Automatic	Full Automatic	Full Automatic
Spark Advance Begins At	600 Engine R.P.M.	600 Engine R.P.M.	600 Engine R.P.M.
Vacuum Advance (Maximum)— (Crankshaft Degrees)	11° @ 10 In. Hg.	20° @ 12.5 In. Hg.	20° @ 12.5 In. Hg.
Governor Advance (Maximum)— (Crankshaft Degrees)	40° @ 2400 Eng. R.P.M.	32° @ 4200 Eng. R.P.M.	32° @ 4200 Eng. R.P.M.
Cam Dwell Angle	27°	26°—33°	26°—33°
Condenser Capacity (Mfds.)	.25—.28	.18—.23	.18—.23

Ignition Coil

Make and Type	Auto-Lite CAD-4001	Delco-Remy 1115084	Delco-Remy 1115084
Ampere Draw—Idling Hot	1.25 Amps.	1.25 Amps.	1.25 Amps.

Spark Plugs

Make and Type	Champion H-10	Champion H-10	Champion H-10
Size	14 MM	14 MM	14 MM
Gap Setting	.033″—.037″	.033″—.037″	.033″—.037″

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ELECTRICAL (Cont'd)

Current Protection

Head, Tail & Parking Light	22 Amp. Circuit Breaker	22 Amp. Circuit Breaker	22 Amp. Circuit Breaker
Stop Light	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Body	22 Amp. Circuit Breaker	22 Amp. Circuit Breaker	22 Amp. Circuit Breaker
Dome Light	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Directional Signal	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse
Courtesy Light	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Clock	A9A 2 Amp. Fuse	A9A 2 Amp. Fuse	A9A 2 Amp. Fuse
Overdrive	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Windshield Washer	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse
Heater	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse
Radio	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse
Suspension—Load Compensator Circuit		AGC 25 Amp. Fuse	AGC 25 Amp. Fuse

Lighting & Accessories

Headlight Bulb—Sealed Beam	40—50 Watts	40—50 Watts	40—50 Watts
Horn—Make	Sparks Withington	Sparks Withington	Sparks Withington
Horn—Location	Radiator Cradle Support	Radiator Cradle Support	Radiator Cradle Support
Clock—Type and Make	Electric—Borg	Electric—Borg	Electric—Borg
Radio—Make—Push Button Type	Delco	Delco	Delco
Universal Tuning Type	Delco	Delco	Delco
Ampere Draw of Headlights—Each	3.35—4.19 @ 12.8 Volts	3.35—4.19 @ 12.8 Volts	3.35—4.19 @ 12.8 Volts
Ampere Draw of Horns	17 Amps.	17 Amps.	17 Amps.
Ampere Draw of Heater Blower Motor	6.5 Amps. @ 14 Volts @ 3000 R.P.M.	6.5 Amps. @ 14 Volts @ 3000 R.P.M.	6.5 Amps. @ 14 Volts @ 3000 R.P.M.
Ampere Draw of Radio	3.2 Amps. @ 12 Volts	3.2 Amp. @ 12 Volts	3.2 Amps. @ 12 Volts

ENGINE

General Information

Make	Packard	Packard	Packard
Type	90° V	90° V	90° V
A.M.A. Horsepower	46.5	51.2	51.2
Maximum Brake Horsepower	225 @ 4600 R.P.M.	245 @ 4600 R.P.M.	260 @ 4600 R.P.M. 275 @ 4800 R.P.M. (5588)
Suspension	Rubber Mounted	Rubber Mounted	Rubber Mounted
Numbering System (front to rear)			
Left Bank	1-3-5-7	1-3-5-7	1-3-5-7
Right Bank	2-4-6-8	2-4-6-8	2-4-6-8
Firing Order	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2
Torque	325 ft. lbs. @ 2400-2800 R.P.M.	355 ft. lbs. @ 2400-2800 R.P.M.	355 ft. lbs. @ 2400-2800 R.P.M. 355 ft. lbs. @ 2400-3200 R.P.M. (5588)
Bore	3 13/16"	4"	4"
Stroke	3½"	3½"	3½"
Piston Displacement	320 cu. in.	352 cu. in.	352 cu. in.
Cylinders	8	8	8
Compression Ratio	8.5 to 1	8.5 to 1	8.5 to 1
Cylinder Head Material	Cast Iron	Cast Iron	Cast Iron
Engine Revolutions per Mile	Wheel revolutions per mile (see wheels) times rear axle gear ratio (see rear axle) gives engine revolutions per mile. With overdrive, multiply engine revolutions per mile by .722.		

Connecting Rod

Weight	1 lb. 10.688 oz.	1 lb. 10.688 oz.	1 lb. 10.688 oz.
Material	Steel Forging	Steel Forging	Steel Forging
Bearing Type	Detachable Shell	Detachable Shell	Detachable Shell
Center to Center Length	6 23/32"	6 23/32"	6 23/32"
Length of Crankpin	2⅛"	2⅛"	2⅛"
Clearance Bearing to Crankpin	.0005" to .0025"	.0005" to .0025"	.0005" to .0025"
End Play on Crankshaft	.003" to .011"	.003" to .011"	.003" to .011"
Oil to Piston Pin	Splash	Splash	Splash
Bearing Material	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt
Assembled in Engine	Oil Holes Toward Camshaft	Oil Holes Toward Camshaft	Oil Holes Toward Camshaft
Bearing Adjustment	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells

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ENGINE (Cont'd)

Crankshaft

Type	Counterbalanced	Counterbalanced	Counterbalanced
Material	Cast-Steel	Cast-Steel	Cast-Steel
Number of Counterweights	6	6	6
Number of Main Bearings	5	5	5
Main Bearing Journal Diameter	2.4990"	2.4990"	2.4990"
Connecting Rod Journal Diameter	2.250"	2.250"	2.250"
Main Bearing Length No. 1	.950"	.950"	.950"
No. 2	.950"	.950"	.950"
No. 3	.950"	.950"	.950"
No. 4	.950"	.950"	.950"
No. 5	1.736"	1.736"	1.736"
Total Effective Main Bearing Area	44.46 sq. in.	44.46 sq. in.	44.46 sq. in.
Thrust Taken On	No. 5—Rear Main	No. 5—Rear Main	No. 5—Rear Main
Vibration Damper	Rubber Friction Disc	Rubber Friction Disc	Rubber Friction Disc
Weight	55 lbs.	55 lbs.	55 lbs.
End Play	.0035" to .0085"	.0035" to .0085"	.0035" to .0085"
Main Bearing Material	Steel Backed Babbitt	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt
Clearance—All Main Bearings	.0005" to .0025"	.0005" to .0025"	.0005" to .0025"
Crankshaft Sprocket—Material and Size	Steel—24 Teeth	Steel—24 Teeth	Steel—24 Teeth
Bearing Adjustment	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells

Camshaft and Chain

Gear Cover	Cast Iron	Cast Iron	Cast Iron
Camshaft Drive	Silent Chain	Silent Chain	Silent Chain
Make of Chain	Morse	Morse	Morse
Length, Width, & Pitch of Chain	64 Links 1", .375"	64 Links 1", .375"	64 Links 1", .375"
Number of Camshaft Bearings	5	5	5
Clearance of Camshaft Bearings	.0005" to .0045"	.0005" to .0045"	.0005" to .0045"
Camshaft End Play	.004" to .006"	.004" to .006"	.004" to .006"
Camshaft Sprocket—Material and Size	Hardened Cast Iron—48 Teeth	Hardened Cast Iron—48 Teeth	Hardened Cast Iron—48 Teeth

Oiling System

Type	Full Pressure	Full Pressure	Full Pressure
Oil Pump Type	Gear	Gear	Gear
Crankcase Capacity	5 qts.	5 qts.	5 qts.
Oil Filler Location	Front of Engine	Front of Engine	Front of Engine
Oil Measuring Stick	Right Crankcase	Right Crankcase	Right Crankcase
Oil Filter Location	Front—Between V	Front—Between V	Front—Between V
Oil Pump Intake	Floating Screen	Floating Screen	Floating Screen
Crankcase Ventilator	Yes	Yes	Yes
Oil Pressure—Normal Driving	45 lbs. @ 2800 R.P.M.	45 lbs. @ 2800 R.P.M.	45 lbs. @ 2800 R.P.M.
Oil Drain Plug	5/8"—18 Thread	5/8"—18 Thread	5/8"—18 Thread

Pistons

Type	Autothermic—Slipper Type	Authothermic—Slipper Type	Autothermic—Slipper Type
Material	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy
Weight	22.293 oz.	24.763 oz.	24.763 oz.
Overall Height	4.197"	4.197"	4.197"
Height Centerline of Pin to Top	2.072"	2.072"	2.072"
Skirt Clearance (bottom)	.000"—.0015"	.000"—.0015"	.000"—.0015"
Assemble "F" on Strut Toward	Front of Engine	Front of Engine	Front of Engine
Piston Pin Size	3 1/4" x .9803"	3 1/4" x .9803"	3 1/4" x .9803"
Type Pin	Floating	Floating	Floating
Lubrication of Pin	Splash	Splash	Splash
Piston Pin Fit in Piston	Palm Push Fit @ 160°	Palm Push Fit @ 160°	Palm Push Fit @ 160°
Piston Pin Fit in Rod	Finger Push Fit	Finger Push Fit	Finger Push Fit
Piston Pin Oversizes	.003" & .006"	.003" & .006"	.003" & .006"

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ENGINE (Cont'd)

Pistons (Cont'd)

Number of Rings per Piston	3	3	3
Number of Oil Rings per Piston	1	1	1
Number of Compression Rings per Piston	2	2	2
Width of Compression Rings	.078″	.078″	.078″
Width of Oil Ring	.186″	.186″	.186″
Piston Ring Gap—Compression	.015″	.019″	.019″
Piston Ring Gap—Oil	.015″	.018″	.018″
Location of Rings	Above Pin	Above Pin	Above Pin
Piston Oil Drain Hole	(8)—5/32″ Dia. Holes	(8)—5/32″ Dia. Holes	(8)—5/32″ Dia. Holes
Piston Oversizes	.010″, .020″, .030″	.010″, .020″, .030″	.010″, .020″, .030″

Valves

Valve Lift—Inlet	.374″	.374″	.374″
—Exhaust	.374″	.374″	.374″
Valve Arrangement	Overhead	Overhead	Overhead
Valve Head Diameter—Inlet	1.937″	1.937″	1.937″
—Exhaust	1.687″	1.687″	1.687″
Valve Stem Diameter—Inlet	.3725″	.3725″	.3725″
—Exhaust	.3715″	.3715″	.3715″
Valve Stem Oversizes	.003″, .010″, .020″, .030″	.003″, .010″, .020″, .030″	.003″, .010″, .020″, .030″
Valve Overall Length—Inlet	5.712″	5.712″	5.712″
—Exhaust	5.690″	5.690″	5.690″
Valve Material—Inlet	Silichrome Steel	Silichrome Steel	Silichrome Steel
—Exhaust	Austenitic Steel	Austenitic Steel	Austenitic Steel
Valve Spring Keeper—Type	Split Cone	Split Cone	Split Cone
Valve Stem Clearance—Inlet	.001″—.002″	.001″—.002″	.001″—.002″
—Exhaust	.002″—.003″	.002″—.003″	.002″—.003″
Valve Tappet Clearance	Automatic Take-Up	Automatic Take-Up	Automatic Take-Up
Inlet Valve Opens	14° BTDC	14° BTDC	14° BTDC
Inlet Valve Closes	56° ALDC	56° ALDC	56° ALDC
Exhaust Valve Opens	52° BLDC	52° BLDC	52° BLDC
Exhaust Valve Closes	18° ATDC	18° ATDC	18° ATDC
Tappet Clearance for Timing	Not Used	Not Used	Not Used
Valve Seat Angle—Inlet	30°	30°	30°
—Exhaust	45°	45°	45°
Valve Spring	Single	Single	Single
Valve Spring Load—Valve Closed	78 to 86 lbs. @ 1¾″	78 to 86 lbs. @ 1¾″	78 to 86 lbs. @ 1¾″
—Valve Opened	158 to 172 lbs. @ 1⅜″	158 to 172 lbs. @ 1⅜″	158 to 172 lbs. @ 1⅜″

Exhaust System

Exhaust Pipe Diameter	2¼″	2¼″ (Dual—Optional)	2″ (Dual)
Muffler Size	31⅛″ x 8″ x 5″	28⅝″ x 8″ x 5″ (Dual—Optional)	28″ x 8″ x 5″ (Dual)
Muffler Silencer	None	12″ x 5⅛″ (Dual—Optional)	14″ x 8¼″ x 4½″ (Dual)
Tail Pipe Diameter	2″	2″ (Dual—Optional)	1¾″ (Dual)

FRAME

Description	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member
Depth (Maximum)	5″	5″	5 1/16″
Thickness (Maximum)	7/64″	7/64″	9/64″
Flange Width (Maximum)	2¼″	2¼″	2 9/32″

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FRONT SUSPENSION

Make	Packard	Packard	Packard
Type	Independent Parallelogram	Independent Parallelogram	Independent Parallelogram
Steering Knuckle	Reverse Elliot	Reverse Elliot	Reverse Elliot
Steering Knuckle Pin Bearings	.866" x 1.187" x 1.189" —O.D. Bushing	.866" x 1.187" x 1.189" —O.D. Bushing	.866" x 1.187" x 1.189" —O.D. Bushing
—Lower	Needle Bearing Used with P.S.	Needle Bearing Used with P.S.	Needle Bearing Used with P.S.
—Upper	Needle Bearing	Needle Bearing	Needle Bearing
Thrust Bearings	Steel Ball Bearing	Steel Ball Bearing	Steel Ball Bearing
Caster	Neg. 1° Plus-Minus ½°	Neg. 1° Plus-Minus ½°	Neg. 1° Plus-Minus ½°
Front Wheel Toe-In	0 Plus 1/16" Minus 0	0 Plus 1/16" Minus 0	0 Plus 1/16" Minus 0
Knuckle Pin Angle	5° 50′	5° 50′	5° 50′
Camber	0° Plus ¾° Minus ¼°	0° Plus ¾° Minus ¼°	0° Plus ¾° Minus ¼°
Wheel Bearing—Inner & Outer	Tapered Roller	Tapered Roller	Tapered Roller
Wheel Bearing Adjustment	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock
Tread	59.7"	59.7"	60"

FUEL SYSTEM

Carburetor

Make and Type	Carter WCFB-2232-S	Rochester 4GC	Rochester 4GC 2—Rochester 4GC (5588)
Bore Size	1 5/16" Four Barrel	1 5/16" Four Barrel	1 5/16" Four Barrel
Main Venturi	Pri.—1 1/16", Sec. 1 5/16"	Pri.—1 1/16", Sec. 1"	Pri.—1 1/16", Sec. 1"
Float Setting	Pri.—1/8", Sec.—5/32"	1 5/8"	1 5/8"
Float Drop	Pri.—15/32", Sec. ½"	2¼"	2¼"
Measured From	Float to Cover	Float Bottom to Cover Gasket	Float Bottom to Cover Gasket
Metering Rod No.	75-1163		
Economy Step	.074"		
Power Step	.0625"		
Center Step Tapers To	.069"		
Main Metering Jet	Pri.—.098" (No. 40 Drill) Sec.—.052" (No. 55 Drill)	Pri.—.050" Sec.—.058"	Pri.—.050" Sec.—.058"
Low Speed Jet	.031" (No. 68 Drill)		
Idle Tube		Pri.—.027", Sec.—.027"	Pri.—.027", Sec.—.027"
By-Pass Jet	.0625" (No. 52 Drill)		
Economizer Jet	.051" (1.3 MM Drill)		
Idle Bleed	.055" (No. 54 Drill)		
Idle Needle Hole		.040"	.040"
Anti-Percolator Jet	.026" (No. 71 Drill)		
Pump Discharge Jet	.025" (No. 72 Drill)	.026"	.026"
Idle Adjustment Turns Out	1 to 1½	1 to 1½	1 to 1½
Idle Adjustment—Engine R.P.M. Std. & O.D. Trans.	400 to 450 R.P.M.	400 to 450 R.P.M.	
Ultra. (Shift Lever in High)	400 R.P.M.	400 R.P.M.	400 R.P.M.
Choke Adjustment	1 Notch Rich	On Index	On Index
Air Cleaner and Silencer	Oil Bath	Oil Bath	Oil Bath
Fuel Inlet Filter	Ceramic	Ceramic	Ceramic

Fuel Pump

Make and Type	Carter M-2198S	Carter M-2198S	Carter M-2198S
Pump Drive	Eccentric—Frt. End of Camshaft	Eccentric—Frt. End of Camshaft	Eccentric—Frt. End of Camshaft
Pressure—PSI	3½ to 5½	3½ to 5½	3½ to 5½
Capacity—60 Seconds	2 Pints	2 Pints	2 Pints
Inlet Side	Inward	Inward	Inward
Outlet Side	Outward	Outward	Outward
Vacuum Pump	AC—Vane Type	AC—Vane Type	AC—Vane Type
Vacuum @ 1800 Eng. R.P.M.	20 in. Hg.	20 in. Hg.	20 in. Hg.
Vacuum Connection	Right Side Crankcase	Right Side Crankcase	Right Side Crankcase
Fuel Tank Capacity—Gallons	20	20	20
Fuel Filter	At Carburetor Inlet	At Carburetor Inlet	At Carburetor Inlet
Fuel Gauge	Electric	Electric	Electric

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REAR AXLE

Make and Type	Packard Semi-Floating	Packard Semi-Floating	Packard Semi-Floating
Final Drive	Hypoid Gears	Hypoid Gears	Hypoid Gears
Propulsion	Through Rear Springs	Torque Arms	Torque Arms
Axle Housing	Swedged Tube Banjo Type	Swedged Tube Banjo Type	Swedged Tube Banjo Type
Oil Capacity	4¼ Pints	4¼ Pints	4¼ Pints
Wheel Bearings	Tapered Rollers	Tapered Rollers	Tapered Rollers
Tread	60″	60″	60.9″
Gear Ratio—Std. Transmission	3.9 to 1	3.9 to 1	
Overdrive	3.9 to 1	3.9 to 1	
Ultramatic	3.23 to 1 (5542-47) 3.07 to 1 (5522)	3.23 to 1	3.07 to 1 3.23 to 1 3.54 to 1
Pinion Backlash	.004″ to .008″	.004″ to .008″	.004″ to .008″
Number of Teeth—Gear & Pinion			
—Std.	39-10	39-10	
—Ultramatic	42-13	42-13	39-11
Oil Drain Plugs	⅝″—18 Thread	⅝″—18 Thread	⅝″—18 Thread

UNIVERSAL JOINT

Make	Std. & O.D.—Spicer Ultra.—Universal Prod.	Std. & O.D. Spicer Ultra.—Universal Prod.	Ultra.—Universal Prod.
Type			
Std. & O.D. Trans.	Cross and Yokes	Cross and Yokes	
Ultra. Drive	Front—Balls & Trunnion Rear—Cross & Yokes	Front—Balls & Trunnion Rear—Cross & Yokes	Front—Balls & Trunnion Rear—Cross & Yokes
Number Required	2	2	2

SPRINGS

Front—Coil	2040 Load x 90 Rate
Front—Size	4¼″ Inside Diameter
Rear—Leaf	950 Load x 95 Rate
Rear Length & Width	54⅜″ x 2½″
Shackles	Rubber Mounted
Shock Absorbers—Hydraulic	Direct Acting 1″ Dia.
Stabilizer—Front	Torsional
Spring Material	Silico-Manganese Steel

STEERING GEAR

Make	Packard—Gemmer	Packard—Gemmer	Packard—Gemmer
Type	Worm & Three Tooth Roller	Worm & Three Tooth Roller	Worm & Three Tooth Roller
Steering Wheel	18″—2 Spokes	18″—2 Spokes	18″—2 Spokes
Conventional Steering			
Ratio—Gear	22.3 to 1	22.3 to 1	22.3 to 1
Ratio—Overall	30.9 to 1	30.9 to 1	30.9 to 1
Minimum Turning Radius	21½ ft.	21½ ft.	22½ ft.
Power Steering			
Ratio—Gear	18.2 to 1	18.2 to 1	18.6 to 1
Ratio—Overall	22.0 to 1	22.0 to 1	22.5 to 1
Minimum Turning Radius	20½ ft.	20½ ft.	21½ ft.

TORSION-LEVEL SUSPENSION

Make		Packard	Packard
Type		Full Length Torsion Bar	Full Length Torsion Bar
Spring (Front)		Main Torsion Bar	Main Torsion Bar
Material		Silico-Manganese Steel	Silico-Manganese Steel
Torsion Bar (Long)		Main Suspension	Main Suspension
—Size		106″ x 1″	111″ x 1″

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MODELS	CLIPPER DELUXE—CLIPPER SUPER	CLIPPER CUSTOM	PACKARD
CHASSIS SYMBOLS	5540	5560	5580

TORSION-LEVEL SUSPENSION (Cont'd)

Torsion Bar (Short)		Load Compensator	Load Compensator
—Size		46.125" x .8125"	51" x .8125"
Spring (Rear)		Main Torsion Bar	Main Torsion Bar
Shock Absorber		Direct Acting 1" Dia.	Direct Acting 1" Dia.
Stabilizer—Front		Torsional	Torsional
Stabilizer—Rear		2—Link Type Torsional	2—Link Type Torsional
Load Compensator Control		Electric—Automatic	Electric—Automatic

TRANSMISSION

Type			
Standard	Selective—Silent Synchronized	Selective—Silent Synchronized	
Overdrive	Sp. Equipment	Sp. Equipment	
Twin Ultramatic	Sp. Equipment	Sp. Equipment	Std. Equipment
Transmission Ratios	STD. O.D. ULTRA.	STD. O.D. ULTRA.	ULTRAMATIC
Overdrive	.722 to 1	.722 to 1	
Direct	1 to 1 1 to 1	1 to 1 1 to 1	1 to 1
Second	1.58 to 1	1.58 to 1	
Low	2.49 to 1 1.82 to 1	2.49 to 1 1.82 to 1	1.82 to 1
Reverse	3.15 to 1 1.63 to 1	3.15 to 1 1.63 to 1	1.63 to 1
Oil Capacity—Std. Trans.	3¼ Pints	3¼ Pints	
Oil Capacity—Overdrive Unit	1¼ Pints	1¼ Pints	
Oil Capacity—Automatic	11 qts.	11 qts.	11 qts.
Gear Tooth	Helical	Helical	
Oil Level Plugs—Std. & O.D.	½" Pipe	½" Pipe	
Oil Level Indicator—Automatic	Filler Cap Dip Stick Right Side—Under Hood	Filler Cap Dip Stick Right Side—Under Hood	Filler Cap Dip Stick Right Side—Under Hood

WHEELS

Type	Demountable Disc (15" x 5½" 'K' Rim)	Demountable Disc (15" x 5½" 'K' Rim)	Demountable Disc (15" x 6" 'L' Rim)
Size	7.60 x 15	7.60 x 15	8.00 x 15
Wheel Rev. Per Mile	731	731	717
Recommended Tire Pressure—Cold			
—Front	24 lbs.	24 lbs.	24 lbs.
—Rear	24 lbs.	24 lbs.	24 lbs.
For loads in excess of four passengers			
—Cold—Front	26 lbs.	26 lbs.	26 lbs.
—Rear	26 lbs.	26 lbs.	26 lbs.

CAR DIMENSIONS

Wheel Base	122"	122"	127"
Overall Length—Bumper to Bumper	214 13/16"	214 13/16"	218½"
Overall Height—Loaded	62" (Sedan)	62" (Sedan)	62.3" (Patrician Sedan)
Overall Width	78"	78"	78"

55th SERIES CHASSIS AND BODY SYMBOLS

MODELS		CLIPPER DELUXE	CLIPPER SUPER	CLIPPER CUSTOM	PACKARD
CHASSIS SYMBOLS			5540	5560	5580
BODY TYPES	Pass.				
SEDAN	6	5522	5542	5562	5582
HARD TOP	6		5547	5567	5587
CARIBBEAN	6				5588*
WHEEL BASE			122"		127"
OVERALL LENGTH			214 13/16"		218½"

*352 Cu. In. 275 HP 2—4 BBL Carburetors

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TORQUE SPECIFICATIONS

Important—The torque set forth in this chart occasionally varies on the same thread size and pitch diameter, for example: 3/8-16 may show three different torque specifications. The difference in specification means that the material is made from a different steel, or heavy torque is not required because of the particular location. In such cases the chart will be marked with an asterisk (*) which indicates anything other than the standard torque.

Note: The following is a list of the various size nuts and bolts used throughout the car with the corresponding tightening torque values. These torques are to be used for any function not covered in the detail torque listing.

SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
6-32		10-15
8-32		15-20
10-32		20-30
12-24		40-50
14-24		60-70
1/4-20 or 28		90-100
5/16-18 or 24	15-18	
3/8-16 or 24	25-30	
7/16-14 or 20	55-60	
1/2-20	65-75	
9/16-18	110-125	
5/8-18	140-165	

CHASSIS TORQUE SPECIFICATIONS

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
BRAKES			
Brake Equalizer Lever Link Nut	3/8-24	25-30	
Brake Master Cylinder Screw	3/8-24	25-30	
Brake Master Cylinder to Pedal Connecting Rod Nut	7/16-20	25-30*	
Brake Pedal Pad Screw	5/16-24	15-18	
Brake Support Plate (Rear) Screw Nut	3/8-24	45-50*	
Brake Support Plate (Front) Screw Nut	7/16-20	45-50*	
Brake Shoe Anchor Pin Nut	5/8-18	85-90	
Brake Cylinder Screw	5/16-18	15-18	
Brake Tube Front End Junction Screw	5/16-18	15-18	
Brake Tube Rear Axle Junction Vent Screw	7/16-20	30-45*	
Brake Master Cylinder Shield Screw RHD	5/16-18	15-18	
Brake Toe Board Plate to Toe Board Screw	14-10		30-40*
Brake Handle to Instrument Board Screw (Shakeproof)	1/4-20		90-100
Brake Parking Rear Wheel Cable to Brake Support Plate Clip Screw	5/16-12	12-14*	
Brake Parking Rear Wheel Cable to Frame Clip Bolt	5/16-24	15-18	
Brake (Power) Unit Assembly to Toe Board Bolt Nut	5/16-24	15-18	
Brake (Power) Pedal to Dash Bracket Bolt Nut	1/4-20		90-100
Brake (Power) Vacuum Tank Assembly to Fender Splasher Screw	14-10		40-50*
BUMPERS			
Bumper Front Support Outer to Bumper Guard Bolt Nut	7/16-14	40-45*	
Bumper Front Impact Bar Upper to Lower Bolt Nut	3/8-24	25-30	
Bumper Front Support Inner to Frame Adjusting Nut	5/8-18	110-125*	
Bumper Front Support Side to Frame Bolt	5/8-18	110-125*	
Bumper Front Support Side to Impact Bar Bolt	1/2-20	65-75	
Bumper Front Support Inner Bolt Nut	1/2-20	65-75	
Bumper Rear Assembly Bolt to Support Inner and Outer	1/2-20	65-75	
Bumper Rear Guard to Impact Bar Bolt	7/16-14	40-45*	
Bumper Rear Impact Bar Extension to Bumper Rear Impact Bar End Screw	5/16-24	15-18	
Bumper Rear Impact Bar to Impact Bar End Screw	3/8-24	25-30	
Bumper Rear Impact Bar Stud to Extension Nut	1/4-28		90-100
Bumper Rear Impact Bar Upper Bolt Nut	5/16-24	15-18	
Bumper Rear License Plate Bracket Adjusting Clamp Bolt	1/4-28		90-100
Bumper Rear License Plate Bracket and Clamp Assembly Screw	1/4-28		90-100
Bumper Rear Support Side Impact Bar End Screw	7/16-20	55-60	

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CHASSIS TORQUE SPECIFICATIONS (Cont'd)

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
CLUTCH			
Clutch Release Lever Ball Nut	7/16-20	45-50*	
Clutch Relay Shaft Bearing Retainer Screw	1/4-28		90-100
Clutch Relay Shaft (Outer) Clamp Bolt	3/8-24	25-30	
Clutch Relay Shaft to Release Lever Link Nut	5/16-24	15-18	
Clutch Pedal Booster Spring Bracket Bolt	3/8-16	25-30	
Clutch Pedal Pad Screw Nut	5/16-24	15-18	
Clutch Pedal to Relay Shaft Lever Link	5/16-24	15-18	
Clutch Relay Lever Pivot Screw	5/16-18	15-18	
Clutch Relay Lever Frame Pivot Bracket Screw	3/8-24	25-30	
Clutch Relay Pivot Screw	1/4-28		90-100
Clutch Relay Lever to Release Lever Rod Nut (Locknut)	5/16-24	15-18	
Clutch Pedal to Relay Shaft Lever Link Locknut	5/16-24	15-18	
Clutch Pedal Retracting Spring Bracket Screw	3/8-16	25-30	
CONTROLS			
All Control Rods, Nuts and Jam Nuts	10-32		20-30
All Control Shafts Bracket Screw	1/4-28		90-100
Kickdown Spring Stop Nut	9/16-18	20-25*	
ELECTRICAL			
Electrical Wiring Harness to Gasoline Tank Gauge Cable Terminal Screw	10-32		15-20*
Electrical Compensator Control Assembly Screw	5/16-24	15-18	
Electrical Compensator Control Assembly Terminal Screw	8-32		15-20
Electrical Compensator Limit Switch Terminal Screw	8-32		15-20
Electrical Compensator Motor Assembly Terminal Nut	12-24		40-50
Electrical Compensator Relay Switch Terminal Nut	10-32		20-30
Electrical Compensator Relay Switch Bracket Bolt	1/4-28		90-100
Electrical Compensator Relay Switch to Switch Bracket Bolt	5/16-24	15-18	
Electrical Compensator Relay Switch Terminal Nut	5/16-24		65-75*
ENGINE			
Camshaft Driving Chain Cover Screw	5/16-18	15-18	
Camshaft Fuel Pump Eccentric Retainer Bolt	3/8-16	25-30	
Camshaft Thrust Plate Bolt	5/16-18	15-18	
Carburetor Assembly to Manifold Nut	5/16-24	15-18	
Carburetor Fuel Inlet Connector (Brass)	1/8-27	8-10	
Carburetor Fuel Inlet Connector Flared Inverted (Brass)	1/8-27	8-10	
Connecting Rod Bolt Nut	3/8-24	40-45	
Crankshaft Bearing Cap No. 1-2-3-4 Screw	1/2-13	90-95	
Crankshaft Bearing Cap No. 5	1/2-13	90-95	
Crankshaft Pulley	3/4-16	130-150	
Cylinder (Oil Filter Drain) Plug	1/8-27	8-10	
Cylinder Head Bolt	7/16-14	55-60	
Cylinder Head Core Hole Plug	1 x 11	45-50	
Cylinder Head Oil Gallery Plug	1/8-27	8-10	
Cylinder Head Water Outlet Cover (Rear) Screw	3/8-16	25-30	
Cylinder Oil Passage Plug	1/4 sq. hd. (pipe)	10-15	
Cylinder Water Jacket Drain Plug	1/8-27	8-10	
Distributor Hold Down Clamp Screw	5/16-18	15-18	
Fan Pulley Screw	1/4-28		90-100
Flywheel Assembly Screw	7/16-20	55-60	
Flywheel Cover to Cylinder Screw	3/8-16	25-30	
Fuel Pump Assembly Screw	3/8-16	25-30	
Fuel Pump to Gasoline Filter Tube Assembly Connector 5/16 Flared Tube Inverted	1/8-27	8-10	
Fuel Pump to Gasoline Filter Tube Assembly Connector Elbow 90° Flared Tube Inverted	1/8-27	8-10	
Fuel Pump Elbow (Gasoline Inlet) 90° 1/8 Street	1/8-27	8-10	

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CHASSIS TORQUE SPECIFICATIONS (Cont'd)

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
ENGINE (Cont'd)			
Gasoline Filter Assembly Connector 5/16 Flared Tube Inverted	1/8-27	8-10	
Generator Assembly Nut	5/16-24	15-18	
Generator Adjusting Strap Screw	5/16-18	15-18	
Generator Bracket Screw	5/16-18	15-18	
Ignition Coil Screw Attaching	5/16-18	15-18	
Ignition Spark Plug	14 MM	26-30	
Manifold (Exhaust) to Cylinder Head Screw	3/8-16	25-30	
Manifold (Intake) to Cylinder Head Screw	3/8-16	25-30	
Manifold (Intake) Stud Nut	3/8-24	25-30	
Oil Pan Assembly Screw and Lockwasher	5/16-18	15-18	
Oil Pan Drain Plug	5/8-18	25-30	
Oil and Vacuum Pump Oil Strainer Assembly Screw	3/8-16	25-30	
Starter Motor Assembly Screw	7/16-14	55-60	
Manifold (Intake) to Carburetor Stud	5/16-18	15-18	
Timing Indicator Screw RH Recess Tapping	1/4-20		90-100
Vacuum Pump and Cover Plate Assembly Screw (to Oil Pump)	1/4-20		90-100
Valve Cover Assembly Screw and Lockwasher Assembly (Split)	5/16-18	15-18	
Valve Tappet Cover and Baffle (Upper) Assembly Screw and Lockwasher	5/16-18	15-18	
Vibration Damper Assembly Screw	3/4-16	130-150	
Motor Water Pump Assembly Screw	3/8-16	25-30	
Water Pump Body Plug	3/8-18	10-12	
Water Pump Cover Screw	5/16-18	15-18	
Water Pump Water Outlet Flange	3/8-16	25-30	
Water Temperature Sending Unit (Cylinder Head)	1/4-18	10-15	
Vacuum Pump to Cylinder Connector 1/4 Inverted	1/8-27	8-10	
ENGINE MOUNTS			
Motor Mount (Front) to Frame Bolt	7/16-20	55-60	
Motor Mount (Front) to Cylinder Bracket (Right and Left)	3/8-16	25-30	
Motor Mount (Rear) to Transmission Bolt	1/2-13	65-75	
Motor Mount (Rear) to Transmission Bolt	3/8-16	25-30	
Motor Mount (Rear) Stud Nut	3/8-24	25-30	
Motor Mount (Rear) Bracket (to "X" Member) Bolt	3/8-24	25-30	
EXHAUST			
Exhaust Muffler Support "U" Bolt	5/16-18	12-15*	
Exhaust Pipe to Manifold Screw	3/8-16	18-20*	
Exhaust Muffler Outlet Tube Support Clamp Intermediate Assembly Screw (to Frame)	5/16-24	15-18	
Exhaust Pipe-Clamp "U" Bolt Nut	5/16-18	12-15*	
Exhaust Tail Pipe Support to Frame Screw	5/16-18	15-18	
Exhaust Pipe Left to Transmission Case Bracket Bolt	1/2-20	65-75	
Exhaust Tail Pipe Support Assembly Rear Screw (to Bumper Bracket)	5/16-24	15-18	
FUEL			
Gasoline Tank Drain Plug	1/4 Pipe	10-15	
Gasoline Tank Gage Terminal Screw	8-32		15-20
Gasoline Tank Support Strap Tee Bolt	3/8-16	30-40*	
RADIATOR			
Radiator Core Cradle to Frame Screw	3/8-24	25-30	
Radiator Hose Clamp Screw	Special		20-25
Radiator Core to Cradle—Screw	1/4-20		90-100
REAR AXLE			
Rear Axle Case Assembly to Carrier Cap Stop Set Screw	1/2-20		25-35
Rear Axle Case Assembly to Carrier Cap Stop Set Screw Lock Nut	1/2-20	35-45	

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CHASSIS TORQUE SPECIFICATIONS (Cont'd)

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
REAR AXLE (Cont'd)			
Rear Axle Case Oil Plugs (Filler and Drain)	5/8-18	25-30*	
Rear Axle Differential Carrier Cap Screw	1/2-20	65-75	
Rear Axle Differential Carrier Oil Plug—2613	3/4 Pipe	18-20	
Rear Axle Differential Driving Gear Idler Locking Plate Screw—2613	5/16-18	15-18	
Rear Axle Differential Driving Gear Idler Shaft Nut	9/16-18	70-75*	
Rear Axle Differential Driving Gear Screw	3/8-24	50-55*	
Rear Axle Differential Driving Gear Screw	7/16-20	75-80*	
Rear Axle Differential Carrier to Case Nut	3/8-24	45-50*	
Rear Axle Shaft Nut	7/8-14	200-270	
Rear Axle Differential Driving Pinion Universal Joint Flange Nut	1-14		
Adjust preload on bearing in assembly to show			42-48 with oil seal.
SHOCK ABSORBERS			
Shock Absorber Assembly Stud Nut	3/8-24	12-18*	
Shock Absorber Assembly Stud Lock Nut	3/8-24	25-30	
Shock Absorber (Front) Bolt Nut	5/16-24	15-18	
Shock Absorber (Rear) Lower Stud Lock Nut	7/16-20	55-60	
SPRING			
Spring (Rear) Bushing Bolt and Shackle Locknut	1/2-20	65-75	
Spring (Rear) Bushing Bolt and Shackle Locknut	9/16-18	70-75*	
Spring (Rear) Clip Nut	1/2-20	45-52*	
Spring (Rear) Rubber Bumper Screw	5/16-18	12-14*	
STABILIZER			
Stabilizer (Front) Assembly to Frame Bolt	7/16-20	55-60	
Stabilizer Rear Rods Support (Front) to Frame Nut	7/16-20	55-60	
Stabilizer Rear Rods Support (Rear) to Front Support Nut	3/8-24	40-45*	
Stabilizer Rear Rod Eye Bushing Retainer Nut	7/16-20	55-60	
STEERING			
Steering Column Clamp Screw	5/16-24	15-18	
Steering Column Gearshift Idler Lever Bracket Screw	1/2-20	65-75	
Steering Column Gearshift Lever to Transmission Extension Lever Rod Sleeve Nut	3/8-24	25-30	
Steering Column to Instrument Board Bracket Retainer Screw	5/16-24	15-18	
Steering Connecting Rod Idler Lever Bushing Nut	7/16-20	55-60	
Steering Connecting Rod Idler Lever and Support Assembly Screw	3/8-24	25-30	
Steering Connecting Rod Idler Lever Bushing Nut	7/8-11	110-125*	
Steering Gear Assembly Bolt	7/16-14	55-60	
Steering Linkage Taper Ball Joint Nut	1/2-20	50-55*	
Steering Linkage Power Cylinder to Frame Bracket Bolt	7/16-20	55-60	
Steering Linkage Control Valve and Cylinder Assembly to Frame Bracket Screw Nut	3/8-24	25-30	
Steering Linkage Power Cylinder Assembly to Frame Bracket Bushing Nut	7/16-20	55-60	
Steering Power Pump Adjustment Screw	3/8-16	25-30	
Steering Power Pump Bracket to Pump Screw	3/8-16	25-30	
Steering Power Pump Pulley Bolt	5/16-18	15-18	
Steering Wheel Horn Ring Contact Plate Screw	6-32		10-15
Steering Wheel to Post Nut	3/4-20	50-55*	
SUSPENSION			
Front wheel bearing nut should be tightened to		20	
Nut should then be backed off 1 hex on all models	3/4-16		
Front Suspension Support Arm (Upper) Shaft Bolt	9/16-18	110-125	

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CHASSIS TORQUE SPECIFICATIONS (Cont'd)

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
SUSPENSION (Cont'd)			
Front Support Arm Bracket Bolt Nut	7/16-20	55-60	
Front Support Pivot Pin (Lower) Nut	7/8-11—Special	85-95*	
Front Support Arm (Lower) Bushing (Inner) Locknut	5/8-18	70-75*	
Front Support Arm (Upper) Bushing (Inner) Locknut	5/8-18	70-75*	
Front Load Arm Bracket Bolt Nut	3/8-24	40-45*	
Front Load Arm Bracket and Lower Support Arm Bracket Bolt Nut	7/16-20	55-60	
Front Support Pivot Pin (Upper) Nut	3/4-11—Special	85-95	
Front Wheel Support and Eccentric Clamp Bolt	7/16-20	55-60	
Rear Support Arm Bracket to Frame Bolt Nut	7/16-20	75-80*	
Rear Support Arm Bushing (Front) Shaft Locknut	1-14	90-100	
Rear Load Arm Link Ball Stud Seat Retainer Assembly to Support Arm Bolt Nut	3/8-24	25-30	
Rear Axle "U" Bolt Nut	9/16-18	110-125*	
Rear Load Arm to No. 5 Body Bracket Pivot Bolt Nut	1/2-20	45-50	
Rear Load Arm and Short Torsion Bar Clamp Bolt	7/16-20	75-80*	
Suspension Compensator Housing Bolt Nut (6)	1/4-28	12-14*	
Suspension Compensator Housing Bolt Nut (1) Left Side Center at Worm Shaft	1/4-28	6	
Suspension Compensator Motor Bolt Nut	5/16-18	15-18	
Suspension Compensator Mounting Bolt (Upper) Nut	3/8-24	40-45*	
Suspension Compensator Mounting Bolt (Lower) Nut	3/8-24	40-45*	
Suspension Torsion Bar (Short) Bearing to Frame Bolt Nut	3/8-24	40-45*	
Suspension Compensator Link Lever and Short Torsion Bar Clamp Bolt	7/16-20	75-80*	
Suspension Torsion Bar (Long) Bushing Retainer to Frame Bolt Nut	3/8-24	25-30	
Suspension Compensator Control Rod Lever and Clamp Bolt Nut	1/4-28		90-100
Suspension Compensator Control Rod to Lever and Compensator Control Retaining Nut	1/4-28		90-100
Suspension Compensator Control Rod Turnbuckle Locknut	1/4-28		90-100
TRANSMISSION			
Ultramatic—Twin Ultramatic			
Transmission Assembly Screw	3/8-16	25-30	
Transmission Bell Housing Assembly Screw	7/16-14	55-60	
Transmission Bell Housing Assembly Plug	1/8-27 Pipe	8-10	
Transmission Brake Band Adjusting Screw	3/4-16		
Tighten with a torque load of 20 lbs. ft. Back off 1.75 turns. Tighten jam nut.			
Transmission Brake Band Adjusting Screw Jam Nut	3/4-16	25-30*	
Transmission Brake (Low) Assembly to Case Screws	5/16-18		108*
Transmission Brake (Rev.) Assembly to Case Screws	5/16-18		108*
Transmission Case Breather Assembly	3/8-18 Pipe	10-12	
Transmission Case Oil Level Plug	1/8-27 Pipe	8-10	
Transmission Control Assembly to Case Screws	5/16-18		108*
Transmission Control Cover to Front Body	10-24		20-30
Transmission Control Detent Assembly to Rear Body	10-24		20-30
Transmission Control Front Body Assembly to Manifold	1/4-20		60*
Transmission Control Plate to Front Body	10-24		20-30
Transmission Control Rear Body Plug	1/8-27	8-10	
Transmission Control Rear Cover to Rear Body	10-24		20-30
Transmission Control Rear Lower Body to Manifold	1/4-20		60*
Transmission Control Rear Lower Body to Upper Body	1/4-20		60*
Transmission Control Rear Plate to Rear Body	10-24		20-30
Transmission Control Rear Plate to Rear Cover	10-24		20-30
Transmission Control Separator Plate to Manifold	1/4-20		60*
Transmission Control Throttle Valve Lever Nut	1/4-28		90-100
Transmission Control Valve (Inner) Set Screw Nut	5/16-24	10-12	
Transmission Control Valve Lever (Outer) Screw Nut	5/16-24	15-18	
Transmission Converter Clutch Pressure Plate Screw	5/16-18	18-20*	
Transmission Converter Clutch Housing Nut	3/8-24	25-30	
Transmission Converter Oil Drain Plug	1/8-27 Pipe	8-10	
Transmission Converter Pump Bolt Nut	5/16-18	20-25*	

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CHASSIS TORQUE SPECIFICATIONS (Cont'd)

FUNCTION	SIZE & THREAD	TORQUE FT. LBS.	TORQUE IN. LBS.
TRANSMISSION (Cont'd)			
Transmission Converter Pump Shaft Screw	5/16-24	20-25*	
Transmission Converter (First) Turbine Screw	5/16-24	20-25*	
Transmission Converter (Second) Turbine Screw	1/4-20	12-15*	
Transmission Front Oil Pump Assembly Screw	1/4-20		90-100
Transmission Front Oil Pump Housing Assembly Screw	5/16-18	15-18	
Transmission Governor Assembly Screw	1/4-20		90-100
Transmission Governor Plate Screw	10-24		20-30
Transmission Governor Pressure Take-Off Plug	1/8-27 Pipe	8-10	
Transmission Oil Cooler Assembly Nut	5/16-18	15-18	
Transmission Oil Cooler Tube Assembly Adapter	1/8-27 Pipe	8-10	
Transmission Oil Cooler Assembly Elbow	1/8-27 Pipe	10-15*	
Transmission Oil Cooler Tube Assembly Nut	1/2-20	10-15*	
Transmission Oil Filler Tube Assembly Nut	1 1/16-16		70-80*
Transmission Oil Pan Screw	5/16-18	10-12*	
Transmission Oil Pan Drain Plug	3/8-18	25-30*	
Transmission Planetary Cage (Rear) Screw	5/16-24	15-18	
Transmission Rear Housing Assembly Screw	5/16-18	15-18	
Transmission Rear Oil Pump Body Assembly Screw	5/16-18	15-18	
Transmission Rear Oil Pump Body Cover Plate Retaining Screw	1/4-20		90-100
Transmission Universal Joint Flange Bolt	3/8-24		
Tighten to 35-40 ft. lbs., back off two turns. Torque tighten to 50 in. lbs.			
Standard			
Transmission Assembly to Bell Housing Bolt	7/16-14	55-60	
Transmission Bell Housing Assembly Screw	7/16-14	55-60	
Transmission Bell Housing Plug	3/4-16	55-60	
UNIVERSAL JOINT			
Universal Joint Shaft Assembly to Flange "U" Bolt Nut	5/16-24	14-17	
Universal Joint Flange Nut	3/4-16	200-225	
Universal Joint Shaft Assembly to Front Flange Bolt	7/16-20	50-60	
Universal Joint Shaft Assembly to Front Flange Bolt	3/8-24	40-50	
Universal Joint Shaft Assembly to Rear Flange Bolt	5/16-24	15-18	
WHEELS			
Wheel Bolts	9/16-18	85-95	

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SECTION XXI

MECHANICAL SPECIFICATIONS AND ADJUSTMENTS

56TH SERIES

CHASSIS SYMBOLS	5640	5660	5680	5688
BRAKES				
Type	Hydraulic 2—Shoe	Hydraulic 2—Shoe	Hydraulic 2—Shoe	Hydraulic 2—Shoe
Effective Area	191.8 sq. in.	191.8 sq. in.	208.25 sq. in.	208.25 sq. in.
Effective Area Hand Brake	85.25 sq. in.	85.25 sq. in.	98.0 sq. in.	98.0 sq. in.
Drum Diameter				
Front	11" Centrifuse	11" Centrifuse	12" Centrifuse	12" Centrifuse
Rear	11" Centrifuse	11" Centrifuse	12" Centrifuse	12" Centrifuse
Lining Size and Material				
Primary Shoes				
Front	9 5/16" x 2½" x 3/16"	9 5/16" x 2½" x 3/16"	11½" x 2¼" x 3/16"	11½" x 2¼" x 3/16"
Rear	9 5/16" x 2" x 3/16"	9 5/16" x 2" x 3/16"	11½" x 2" x 3/16"	11½" x 2" x 3/16"
Material	Marshall—4112	Marshall—4112	Marshall—4112	Marshall—4112
Secondary Shoes				
Front	12" x 2½" x 3/16"	12" x 2½" x 3/16"	13" x 2¼" x 3/16"	13" x 2¼" x 3/16"
Rear	12" x 2" x 3/16"	12" x 2" x 3/16"	13" x 2" x 3/16"	13" x 2" x 3/16"
Material	Marshall—9051	Marshall—9051	Marshall—9051	Marshall—9051
Wheel Cylinder Size				
Front	1⅛" Dia.	1⅛" Dia.	1⅛" Dia.	1⅛" Dia.
Rear	1 1/16" Dia.	1 1/16" Dia.	1" Dia.	1" Dia.
Master Cylinder Size	1" Dia.	1" Dia.	1" Dia.	1" Dia.
Brake (Power Unit)	Sp. Equipment	Sp. Equipment	Std. Equipment	Std. Equipment
CLUTCH				
Type	Single Dry Plate	Single Dry Plate		
Pedal Free Play	1¼" to 1½"	1¼" to 1½"		
Facing Material	Woven Asbestos	Woven Asbestos		
Size of Facing	7" x 11" x .125"	7" x 11" x .125"		
Throw Out Bearing	Prelubricated Ball	Prelubricated Ball		
Clutch Spring Pressure (Total)	1656 lbs.	1656 lbs.		
Number of Springs	8	8		
Vibration Neutralizer	Yes	Yes		
COOLING SYSTEM				
Type	Pressure	Pressure	Pressure	Pressure
Water Pump	Centrifugal Self-Adjusting	Centrifugal Self-Adjusting	Centrifugal Self-Adjusting	Centrifugal Self-Adjusting
Water Pump Drive	Fan Belt	Fan Belt	Fan Belt	Fan Belt
Capacity of System	26 qts.	26 qts.	26 qts.	26 qts.
Heater Capacity				
(One)	½ qt.	½ qt.		
(Two)	1 qt.	1 qt.	1 qt.	1 qt.
Fan	4 Blade—19⅞" Dia.	4 Blade—19⅞" Dia.	4 Blade—19⅞" Dia.	4 Blade—19⅞" Dia.
Drive Pulley	On Crankshaft	On Crankshaft	On Crankshaft	On Crankshaft
Ratio	.92 to 1	.92 to 1	.92 to 1	.92 to 1
Thermostat Starts to Open				
Standard	167° to 173°	167° to 173°	167° to 173°	167° to 173°
High Reading	177° to 182°	177° to 182°	177° to 182°	177° to 182°
Fan Belt	56 11/16" x ⅜"	56 11/16" x ⅜"	56 11/16" x ⅜"	56 11/16" x ⅜"
Fan Belt Adjustment	At Generator	At Generator	At Generator	At Generator
Heat Indicator	Electric	Electric	Electric	Electric
Gravity Flow of Radiator				
(Minimum)	30 Gal. per Min.	30 Gal. per Min.	30 Gal. per Min.	30 Gal. per Min.
Radiator Cap	Pressure Type—12 psi	Pressure Type—12 psi	Pressure Type—12 psi	Pressure Type—12 psi

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ELECTRICAL

Battery

Make and Type	Auto-Lite 3EA-60 Willard HDW-3KM-60	Auto-Lite 3EA-60 Willard HDW-3KM-60	Auto-Lite 3EA-60 Willard HDW-3KM-60	Auto-Lite 3EA-60 Willard HDW-3KM-60
Capacity	60 Ampere Hour	60 Ampere Hour	60 Ampere Hour	60 Ampere Hour
Number of Plates	9 Per Cell	9 Per Cell	9 Per Cell	9 Per Cell
Terminal Grounded	Negative	Negative	Negative	Negative

Starting Motor

Make and Type	Auto-Lite MDF-6008	Auto-Lite MDF-6008	Delco-Remy 1107656	Delco Remy-1107656
Starter Drive	Solenoid Actuated Shift	Solenoid Actuated Shift	Solenoid Actuated Shift	Solenoid Actuated Shift
Number of Flywheel Teeth	182	182	182	182
Number of Teeth in Starter—Pinion	9	9	9	9
Pinion Meshes	From Front	From Front	From Front	From Front
Current Draw—Free Running	60 Amps. Max. @10 Volts	60 Amps. Max. @10 Volts	95 Amps. @10.1 Volts	95 Amps. @10.1 Volts
Current Draw Cranking Engine (70° F.)	200-225 Amps.	200-225 Amps.	200-225 Amps.	200-225 Amps.
Brush Spring Tension	42-53 oz.	42-53 oz.	35 oz.	35 oz.

Generator

Make and Type	Auto-Lite GJC-7002F	Auto-Lite GJC-7002F	Delco-Remy 1102003	Delco-Remy 1102003
Generator Drive	Belt	Belt	Belt	Belt
Generator Output	30 Amps.	30 Amps.	30 Amps.	30 Amps.
Brush Spring Tension	18 to 36 oz.	18 to 36 oz.	28 oz.	28 oz.

Regulator

Make and Type	Auto-Lite VRX-6009A	Auto-Lite VRX-6009A	Delco-Remy 1119123	Delco-Remy 1119123
Maximum Output	30 Amps.	30 Amps.	30 Amps.	30 Amps.
Circuit Breaker				
Air Gap	.031"—.034"	.031"—.034"	.020"	.020"
Contact Gap	.015"	.015"	.020"	.020"
Close Volts	13.0—13.75	13.0—13.75	11.8—13.5	11.8—13.5
Current Regulator				
Air Gap	.048"—.052"	.048"—.052"	.075"	.075"
Amperes	30 Amps.	30 Amps.	30 Amps.	30 Amps.
Voltage Regulator				
Air Gap	.048"—.052"	.048"—.052"	.075"	.075"
Voltage (110° F.)	14.0—14.6	14.0—14.6	13.8—14.8	13.8—14.8

Distributor

Make and Type	Auto-Lite IBJ-4001D	Auto-Lite IBJ-4001C	Delco-Remy 1110865	Delco-Remy 1110873
Ignition Timing	5° BTDC	5° BTDC	10° BTDC	10° BTDC
Breaker Point Gap (Initial Setting)	.017"	.017"	.016"	.016"
Breaker Arm Spring Tension	17-20 oz.	17-20 oz.	19-23 oz.	19-23 oz.
Spark Control	Full Automatic	Full Automatic	Full Automatic	Full Automatic
Spark Advance Begins At	600 Eng. R.P.M.	600 Eng. R.P.M.	600 Eng. R.P.M.	600 Eng. R.P.M.
Vacuum Advance (Maximum)— (Crankshaft Degrees)	24° @12½ In. Hg.	20° @13 In. Hg.	16° @15 In. Hg.	10° @ 16 In. Hg.
Governor Advance (Maximum)— (Crankshaft Degrees)	28° @3400 Eng. R.P.M.	30° @4000 Eng. R.P.M.	24° @4000 Eng. R.P.M.	20° @2600 Eng. R.P.M.
Cam Dwell Angle	27°	27°	26°—33°	26°—33°
Condenser Capacity (Mfgrs.)	.25—.28	.25—.28	.18—.23	.18—.23

Ignition Coil

Make and Type	Auto-Lite CAD-4004	Auto-Lite CAD-4004	Delco-Remy 1115095	Delco-Remy 1115095
Ampere Draw—Idling Hot	2.2 Amps.	2.2 Amps.	1.25 Amps.	1.25 Amps.

Spark Plugs

Make and Type	Champion N-18	Champion N-18	Champion N-18	Champion N-18
Size	14 MM	14 MM	14 MM	14 MM
Gap Setting	.033"—.037"	.033"—.037"	.033"—.037"	.033"—.037"

Current Protection

Head, Tail & Parking Light	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker
Stop Light	AGW—7½ Amp. Fuse (SFE 20 Amp. Fuse with Spring Suspension—5622)	AGW—7½ Amp. Fuse	AGW—7½ Amp. Fuse	AGW—7½ Amp. Fuse
Body	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse

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ELECTRICAL (Con't.)

Dome Light	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Directional Signal	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse
Courtesy Light	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Clock	AGA 2 Amp. Fuse	AGA 2 Amp. Fuse	AGA 2 Amp. Fuse	AGA 2 Amp. Fuse
Overdrive	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse		
Instruments	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse
Windshield Washer	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse	SFE 9 Amp. Fuse
Heater	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse	AGC 15 Amp. Fuse
Radio	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse
Antenna (Electric)	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse	SFE 20 Amp. Fuse
Suspension—Load Compensator Motor	AGC 30 Amp. Fuse	AGC 30 Amp. Fuse	AGC 30 Amp. Fuse	AGC 30 Amp. Fuse
—Control Circuit	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse	AGW 7½ Amp. Fuse
Push Button Circuit	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker	20 Amp. Circuit Breaker

Lighting & Accessories

Headlight Bulb—Sealed Beam	40—50 Watts	40—50 Watts	40—50 Watts	40—50 Watts
Horn—Make	Sparks Withington	Sparks Withington	Sparks Withington	Sparks Withington
Horn—Location	Radiator Cradle Support	Radiator Cradle Support	Radiator Cradle Support	Radiator Cradle Support
Clock—Type and Make	Electric—Borg	Electric—Borg	Electric—Borg	Electric—Borg
Radio—Make—Push Button Type	Delco	Delco	Delco	Delco
Universal Tuning Type	Delco	Delco	Delco	Delco
Ampere Draw of Headlights—Each.	3.35—4.19 @ 12.8 Volts	3.35—4.19 @ 12.8 Volts	3.35—4.19 @ 12.8 Volts	3.35—4.19 @ 12.8 Volts
Ampere Draw of Horns	17 Amps.	17 Amps.	17 Amps.	17 Amps.
Ampere Draw of Heater Blower Motor	6.5 Amps. @ 14 Volts—@ 3000 R.P.M.	6.5 Amps. @ 14 Volts—@ 3000 R.P.M.	6.5 Amps. @ 14 Volts—@ 3000 R.P.M.	6.5 Amps. @ 14 Volts—@ 3000 R.P.M.
Ampere Draw of Radio	3.2 Amps. @ 12 Volts	3.2 Amps. @ 12 Volts	3.2 Amps. @ 12 Volts	3.2 Amps. @ 12 Volts

ENGINE

General Information

Make	Packard	Packard	Packard	Packard
Type	90° V	90° V	90° V	90° V
A.M.A. Horsepower	51.2	51.2	54.45	54.45
Maximum Brake Horsepower	240 @ 4600 R.P.M.	275 @ 4600 R.P.M	290 @ 4600 R.P.M.	310 @ 4600 R.P.M.
Suspension	Rubber Mounted	Rubber Mounted	Rubber Mounted	Rubber Mounted
Numbering System (front to rear)				
Left Bank	1-3-5-7	1-3-5-7	1-3-5-7	1-3-5-7
Right Bank	2-4-6-8	2-4-6-8	2-4-6-8	2-4-6-8
Firing Order	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2
Torque	350 ft. lbs. @ 2800 R.P.M.	380 ft. lbs. @ 2800 R.P.M.	405 ft. lbs. @ 2800 R.P.M.	405 ft. lbs. @ 2800 R.P.M.
Bore	4"	4"	4⅛"	4⅛"
Stroke	3½"	3½"	3½"	3½"
Piston Displacement	352 cu. in.	352 cu. in.	374 cu. in.	374 cu. in.
Cylinders	8	8	8	8
Compression Ratio	9.5 to 1	9.5 to 1	10.0 to 1	10.0 to 1
Cylinder Head Material	Cast Iron	Cast Iron	Cast Iron	Cast Iron
Engine Revolutions per Mile	Wheel revolutions per mile (see wheels) times rear axle gear ratio (see rear axle) gives engine revolutions per mile. With overdrive, multiply engine revolutions per mile by .722.			

Connecting Rod

Weight	1 lb. 10.688 oz.	1 lb. 10.688 oz.	1 lb. 10.688 oz.	1 lb. 10.688 oz.
Material	Steel Forging	Steel Forging	Steel Forging	Steel Forging
Bearing Type	Detachable Shell	Detachable Shell	Detachable Shell	Detachable Shell
Center to Center Length	6 25/32"	6 25/32"	6 25/32"	6 25/32"
Clearance Bearing to Crankpin	.0005" to .0025"	.0005" to .0025"	.0005" to .0025"	.0005" to .0025"
End Play on Crankshaft	.003" to .011" Two Rods	.003" to .011" Two Rods	.003" to .011" Two Rods	.003" to .011" Two Rods
Oil to Piston Pin	Splash	Splash	Splash	Splash
Bearing Material	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt
Assembled in Engine	Oil Holes Toward Camshaft	Oil Holes Toward Camshaft	Oil Holes Toward Camshaft	Oil Holes Toward Camshaft
Bearing Adjustment	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells

Crankshaft

Type	Counterbalanced	Counterbalanced	Counterbalanced	Counterbalanced
Material	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Number of Counterweights	6	6	6	6
Number of Main Bearings	5	5	5	5
Main Bearing Journal Diameter	2.4990"	2.4990"	2.4990"	2.4990"
Connecting Rod Journal Diameter	2.250"	2.250"	2.250"	2.250"

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ENGINE (Cont'd.)				
Main Bearing Length No. 1	.950"	.950"	.950"	.950"
No. 2	.950"	.950"	.950"	.950"
No. 3	.950"	.950"	.950"	.950"
No. 4	.950"	.950"	.950"	.950"
No. 5	1.736"	1.736"	1.736"	1.736"
Total Effective Main Bearing Area	44.46 sq. in.	44.46 sq. in.	44.46 sq. in.	44.46 sq. in.
Thrust Taken On	No. 5—Rear Main	No. 5—Rear Main	No. 5—Rear Main	No. 5—Rear Main
Vibration Damper	Rubber Friction Disc	Rubber Friction Disc	Rubber Friction Disc	Rubber Friction Disc
End Play	.0035" to .0085"	.0035" to .0085"	.0035" to .0085"	.0035" to .0085"
Main Bearing Material	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt	No. 1-2-3-4 Copper Lead No. 5 Steel Backed Babbitt
Clearance—All Main Bearings	.0003" to .0023"	.0003" to .0023"	.0003" to .0023"	.0003" to .0023"
Crankshaft Sprocket—Material and Size	Steel—24 Teeth	Steel—24 Teeth	Steel—24 Teeth	Steel—24 Teeth
Bearing Adjustment	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells	Replace Bearing Shells
Camshaft and Chain				
Camshaft Material	Cast Alloy Iron	Cast Alloy Iron	Cast Alloy Iron	Cast Alloy Iron
Camshaft Drive	Silent Chain	Silent Chain	Silent Chain	Silent Chain
Make of Chain	Morse	Morse	Morse	Morse
Length, Width, & Pitch of Chain	64 Links, 1", .375"	64 Links, 1", .375"	64 Links, 1", .375"	64 Links, 1", .375"
Number of Camshaft Bearings	5	5	5	5
Clearance of Camshaft Bearings	.0005" to .0045"	.0005" to .0045"	.0005" to .0045"	.0005" to .0045
Camshaft End Play	.0035" to .0065"	.0035" to .0065"	.0035" to .0065"	.0035" to .0065"
Camshaft Sprocket—Material and Size	Heat Treated Iron—48 Teeth	Heat Treated Iron—48 Teeth	Heat Treated Iron—48 Teeth	Heat Treated Iron—48 Teeth
Oiling System				
Type	Full Pressure	Full Pressure	Full Pressure	Full Pressure
Oil Pump Type	Gear	Gear	Gear	Gear
Crankcase Capacity	5 qts.	5 qts.	5 qts.	5 qts.
Oil Filler Location	Front of Engine	Front of Engine	Front of Engine	Front of Engine
Oil Measuring Stick	Right Crankcase	Right Crankcase	Right Crankcase	Right Crankcase
Oil Filter Location	Front—Between V	Front—Between V	Front—Between V	Front—Between V
Oil Pump Intake	Floating Screen	Floating Screen	Floating Screen	Floating Screen
Crankcase Ventilator	Yes	Yes	Yes	Yes
Oil Pressure—Normal Driving	45 lbs. @ 2800 R.P.M.	45 lbs. @ 2800 R.P.M.	45 lbs. @ 2800 R.P.M.	45 lbs. @ 2800 R.P.M.
Oil Drain Plug	⅝"—18 Thread	⅝"—18 Thread	⅝"—18 Thread	⅝"—18 Thread
Pistons				
Type	Autothermic—Slipper Type	Autothermic—Slipper Type	Autothermic—Slipper Type	Autothermic—Slipper Type
Material	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy
Weight	24.762 oz.	24.762 oz.	26.067 oz.	26.067 oz.
Overall Height	4.197"	4.197"	4.197"	4.197"
Height Centerline of Pin to Top	2.072"	2.072"	2.072"	2.072"
Skirt Clearance (Bottom)	.000"—.0015"	.000"—.0015"	.000"—.0015"	.000"—.0015"
Assemble Pistons with "Notch" on Piston Head Toward	Front of Engine	Front of Engine	Front of Engine	Front of Engine
Piston Pin Size	3¼" x .9803"	3¼" x .9803"	3¼" x .9803"	3¼" x .9803"
Type Pin	Floating	Floating	Floating	Floating
Lubrication of Pin	Splash	Splash	Splash	Splash
Piston Pin Fit in Piston	Palm Push Fit @ 160° F.	Palm Push Fit @ 160° F.	Palm Push Fit @ 160° F.	Palm Push Fit @ 160° F.
Piston Pin Fit in Rod	Finger Push Fit	Finger Push Fit	Finger Push Fit	Finger Push Fit
Piston Pin Oversize	.003" & .006"	.003" & .006"	.003" & .006"	.003" & .006"
Number of Rings per Piston	3	3	3	3
Number of Oil Rings per Piston	1	1	1	1
Number of Compression Rings per Piston	2	2	2	2
Width of Compression Rings	.078"	.078"	.078"	.078"
Width of Oil Ring	.186"	.186"	.186"	.186"
Piston Ring Gap—Compression	.019"	.019"	.018"	.018"
Piston Ring Gap—Oil	.015"	.015"	.015"	.015"
Location of Rings	Above Pin	Above Pin	Above Pin	Above Pin
Piston Oil Drain Hole	8 5/32" Dia. Holes	8 5/32" Dia. Holes	8 5/32" Dia. Holes	8 5/32" Dia. Holes
Piston Oversize	.010", .020", .030"	.010", .020", .030"	.010", .020", .030"	.010", .020", .030"
Valves				
Valve Lift—Inlet	.398"	.398"	.398"	.398"
—Exhaust	.388"	.388"	.388"	.388"
Valve Arrangement	Overhead	Overhead	Overhead	Overhead
Valve Head Diameter—Inlet	2"	2"	2"	2"
—Exhaust	1.687"	1.687"	1.687"	1.687"

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ENGINE (Cont'd.)

Valve Stem—Diameter—Inlet	.3725″	.3725″	.3725″	.3725″
—Exhaust	.3715″	.3715″	.3715″	.3715″
Valve Stem Oversize	.003″, .010″, .020″, .030″	.003″, .010″, .020″, .030″	.003″, .010″, .020″, .030″	.003″, .010″, .020″, .030″
Valve Overall Length—Inlet	5.712″	5.712″	5.712″	5.712″
—Exhaust	5.690″	5.690″	5.690″	5.690″
Valve Material—Inlet	Silichrome Steel	Silichrome Steel	Silichrome Steel	Silichrome Steel
—Exhaust	Austenitic Steel	Austenitic Steel	Austenitic Steel	Austenitic Steel
Valve Spring Keeper—Type	Split Cone	Split Cone	Split Cone	Split Cone
Valve Stem Clearance—Inlet	.001″—.002″	.001″—.002″	.001″—.002″	.001″—.002″
—Exhaust	.002″—.003″	.002″—.003″	.002″—.003″	.002″—.003″
Valve Tappet Clearance	Automatic Take-Up	Automatic Take-Up	Automatic Take-Up	Automatic Take-Up
Inlet Valve Opens	14° BTDC	14° BTDC	14° BTDC	14° BTDC
Inlet Valve Closes	62° ALDC	62° ALDC	62° ALDC	62° ALDC
Exhaust Valve Opens	54° BLDC	54° BLDC	54° BLDC	54° BLDC
Exhaust Valve Closes	18° ATDC	18° ATDC	18° ATDC	18° ATDC
Tappet Clearance for Timing	Not Used	Not Used	Not Used	Not Used
Valve Seat Angle—Inlet	30°	30°	30°	30°
—Exhaust	45°	45°	45°	45°
Valve Spring	Single	Single	Single	Single
Valve Spring Load—Valve Closed	87 to 97 lbs. @ 1¾″	87 to 97 lbs. @ 1¾″	87 to 97 lbs. @ 1¾″	87 to 97 lbs. @ 1¾″
—Valve Opened	173 to 187 lbs. @ 1⅜″	173 to 187 lbs. @ 1⅜″	173 to 187 lbs. @ 1⅜″	173 to 187 lbs. @ 1⅜″

Exhaust System

Exhaust Pipe Diameter	2″ (5622—Main 2¼″ Branch 2″)	2″	2″	2″
Muffler Size	26″ x 8¾″ x 5″	26″ x 8¾″ x 5″	26″ x 8¾″ x 5″	26″ x 8¾″ x 5″
Muffler Silencer	9¾″ x 5⅛″ x 5″	9¾″ x 5⅛″ x 5″	11⅞″ x 8¾″ x 4¾″	11⅞″ x 8¾″ x 4¾″
Tail Pipe Diameter	1¾″ (5622-2″)	1¾″	1¾″	1¾″

FRAME

Description	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member	Channel Steel Side Members Full Length of Frame Joined Together by Cross Member, Plus X Member
Depth (Maximum)	5″	5″	5″	5″
Thickness (Maximum)	9/64″	9/64″	9/64″	9/64″ (Reinforcement ⅜″ Thick)
Flange Width (Maximum)	2¼″	2¼″	2¼″	2¼″

FRONT SUSPENSION

Make	Packard	Packard	Packard	Packard
Type	Independent Parallelogram	Independent Parallelogram	Independent Parallelogram	Independent Parallelogram
Steering Knuckle	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott
Steering Knuckle Pin Diameter	.866″	.866″	.866″	.866″
—Lower	Bushing—Needle Bearing Used with Power Steering	Bushing—Needle Bearing Used with Power Steering	Bushing—Needle Bearing Used with Power Steering	Needle Bearing
—Upper	Needle Bearing	Needle Bearing	Needle Bearing	Needle Bearing
Thrust Bearings	Ball Bearing	Ball Bearing	Ball Bearing	Ball Bearing
Caster	Neg. 1° Plus-Minus ½°	Neg. 1° Plus-Minus ½°	Neg. 1° Plus-Minus ½°	Neg. 1° Plus-Minus ½°
Front Wheel Toe-In	0 Plus 1/16″ Minus 0	0 Plus 1/16″ Minus 0	0 Plus 1/16″ Minus 0	0 Plus 1/16″ Minus 0
Knuckle Pin Angle	5° 50′	5° 50′	5° 50′	5° 50′
Camber	0° Plus ¾° Minus ¼°	0° Plus ¾° Minus ¼°	0° Plus ¾° Minus ¼°	0° Plus ¾° Minus ¼°
Wheel Bearing—Inner & Outer	Tapered Roller	Tapered Roller	Tapered Roller	Tapered Roller
Wheel Bearing Adjustment	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock	Tighten Nut to 20 ft. lbs. and Back Off 1 Hex & Lock
Tread	59.7″	59.7″	60″	60″

FUEL SYSTEM

Carburetor

Make and Type	Carter WGD-2393-S	Carter WCFB-2394-S	Rochester 4GC-7008610	Rochester 4GC-7009600 (Front) Rochester 4GC-7009601 (Rear)
Bore Size	1 7/16″ Two Barrel	1 7/16″ Four Barrel	1 7/16″ Four Barrel	1 7/16″ Four Barrel
Main Venturi	1 3/16″	Pri.—1 1/16″, Sec. 1¼″	Pri.—1⅛″, Sec. 1¼″	Pri.—1 1/16″, Sec.—1¼″
Float Setting	3/16″	Pri.—⅛″, Sec.—3/16″	1⅝″	1⅝″
Float Drop		Pri.—15/32″, Sec.—17/32″	2¼″	2¼″
Measured From	Float to Cover	Float to Cover	Float Bottom to Cover Gasket	Float Bottom to Cover Gasket
Metering Rod. No.	75-1223	75-1241		

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FUEL SYSTEM (Cont'd.)				
Economy Step	.064"	.072"		
Power Step	.048"	.040"		
Center Step Tapers To	.0555"	.0555"		
Main Metering Jet	.086" (No. 44 Drill)	Pri.—.093" (No. 42 Drill) Sec.—.0785" (No. 47 Drill)	Pri.—.052", Sec.—.065"	Pri.—.048", Sec.—.054"
Low Speed Jet	.032" (No. 67 Drill)	.035" (No. 65 Drill)		
Idle Tube			Pri.—.030", Sec.—.027"	Pri.—.030", Sec.—None
By-Pass Jet	.055" (No. 54 Drill)	.055" (No. 54 Drill)		
Economizer Jet	.052" (No. 55 Drill)	.049" (1.25 MM Drill)		
Idle Bleed	.051" (1.3 MM Drill)	.0629" (1.6 MM Drill)		
Idle Needle Hole			.046"	.046"
Anti-Percolator Jet	.028" (No. 70 Drill)	.028" (No. 70 Drill)		
Pump Discharge Jet	.0225" (No. 74 Drill)	.025" (No. 72 Drill)	.026"	.026"
Idle Adjustment Turns Out	¾ to 1¼	¾ to 1¼	1 to 1½	1 to 1½
Idle Adjustment—Engine R.P.M.				
Std. & O.D. Trans.	450 to 500 R.P.M.	450 to 500 R.P.M.		
Ultra. (Shift Lever in High)	450 R.P.M.	450 R.P.M.	450 R.P.M.	450 R.P.M.
Choke Adjustment	2 Points Rich	On Index	On Index	On Index
Air Cleaner and Silencer	Oil Bath	Oil Bath	Oil Bath	Oil Bath
Fuel Inlet Filter	Ceramic	Ceramic	Ceramic	Ceramic
Fuel Pump				
Make and Type	Carter M-2198-S	Carter M-2198-S	Carter M-2198-S	Carter M-2198-S
Pump Drive	Eccentric—Frt. End of Camshaft	Eccentric—Frt. End of Camshaft	Eccentric—Frt. End of Camshaft	Eccentric—Frt. End of Camshaft
Pressure—PSI	3½ to 5 @ 500 R.P.M.	3½ to 5 @ 500 R.P.M.	3½ to 5 @ 500 R.P.M.	3½ to 5 @ 500 R.P.M.
Capacity—60 Seconds	1 qt. @ 500 R.P.M.	1 qt. @ 500 R.P.M.	1 qt. @ 500 R.P.M.	1 qt. @ 500 R.P.M.
Inlet Side	Inward	Inward	Inward	Inward
Outlet	Outward	Outward	Outward	Outward
Vacuum Pump	AC—Vane Type	AC—Vane Type	AC—Vane Type	AC—Vane Type
Vacuum @ 1800 Eng. R.P.M.	20 in. hg.	20 in. hg.	20 in. hg.	20 in. hg.
Vacuum Connection	Right Side Crankcase	Right Side Crankside	Right Side Crankcase	Right Side Crankcase
Fuel Tank Capacity—Gallons	20	20	20	20
Fuel Filter	At Carburetor Inlet	At Carburetor Inlet	At Carburetor Inlet	At Carburetor Inlet
Fuel Gauge	Electric	Electric	Electric	Electric
REAR AXLE				
Make and Type	Packard-Spicer Semi-Floating	Packard-Spicer Semi-Floating	Packard-Spicer Semi-Floating	Packard-Spicer Semi-Floating
Final Drive	Hypoid Gears	Hypoid Gears	Hypoid Gears	Hypoid Gears
Propulsion	Torque Arms (5622 Optional—Rear Spring)	Torque Arms	Torque Arms	Torque Arms
Axle Housing	Removable Cover Type	Removable Cover Type	Removable Cover Type	Removable Cover Type
Oil Capacity	3 Pints	3 Pints	3½ Pints	3½ Pints
Wheel Bearings	Prelubricated Ball	Prelubricated Ball	Prelubricated Ball	Prelubricated Ball
Tread	59 63/64"	59 63/64"	60.9"	60.9"
Gear Ratio—Std. Transmission	Optional Ratio No. Teeth 3.54 to 1, 46-13 4.09 to 1, 45-11	Optional Ratio No. Teeth 3.54 to 1, 46-13 4.09 to 1, 45-11		
Overdrive	Optional Ratio No. Teeth 3.54 to 1, 46-13 4.09 to 1, 45-11	Optional Ratio No. Teeth 3.54 to 1, 46-13 4.09 to 1, 45-11		
Ultramatic	Optional Ratio No. Teeth 2.87 to 1, 43-15 3.07 to 1, 43-14 3.31 to 1, 43-13 3.54 to 1, 46-13 4.09 to 1, 45-11	Optional Ratio No. Teeth 2.87 to 1, 43-15 3.07 to 1, 43-14 3.31 to 1, 43-13 3.54 to 1, 46-13 4.09 to 1, 45-11	Optional Ratio No. Teeth 2.87 to 1, 43-15 3.07 to 1, 43-14 3.31 to 1, 43-13 3.54 to 1, 46-13 4.09 to 1, 45-11	Optional Ratio No. Teeth 2.87 to 1, 43-15 3.07 to 1, 43-14 3.31 to 1, 43-13 3.54 to 1, 46-13 4.09 to 1, 45-11
Pinion Backlash	.003" to .006"	.003" to .006"	.003" to .006"	.003" to .006"
Oil Drain & Fill Plugs	¾"—Pipe	¾"—Pipe	¾"—Pipe	¾"—Pipe
UNIVERSAL JOINT				
Make	Std. & O.D. Spicer Ultra.—Universal Prod.	Std. & O.D. Spicer Ultra.—Universal Prod.	Ultra.—Universal Prod.	Ultra.—Universal Prod.
Type				
Std. & O.D. Trans.	Cross and Yokes	Cross and Yokes		
Ultra. Drive	Front—Balls & Trunnion Rear—Cross & Yokes	Front—Balls & Trunnion Rear—Cross & Yokes	Front—Balls & Trunnion Rear—Cross & Yokes	Front—Balls & Trunnion Rear—Cross & Yokes
Number Required	2	2	2	2

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SPRINGS

Front—Coil	2040 Load x 90 Rate
Front—Size	4¼ Inside Diameter
Rear—Leaf	950 Load x 95 Rate
Rear Length & Width	54⅜" x 2½"
Shackles	Rubber Mounted
Shock Absorbers—Hydraulic	Direct Acting 1" Dia.
Stabilizer—Front	Torsional
Spring Material	Silico-Manganese Steel (Model 5622)

STEERING GEAR

Make	Packard—Gemmer	Packard—Gemmer	Packard—Gemmer	Packard—Gemmer
Type—Conventional Steering	Worm & Three Tooth Roller	Worm & Three Tooth Roller	Worm & Three Tooth Roller	
—Power Steering	Worm & Two Tooth Roller	Worm & Two Tooth Roller	Worm & Two Tooth Roller	Worm & Two Tooth Roller
Steering Wheel	18"—2 Spokes	18"—2 Spokes	18"—2 Spokes	18"—2 Spokes

Conventional Steering

Ratio—Gear	22.3 to 1	22.3 to 1	22.3 to 1	
Ratio—Overall	30.9 to 1	30.9 to 1	30.9 to 1	
Minimum Turning Radius	21½ ft.	21½ ft.	22½ ft.	

Power Steering

Ratio—Gear	16.4 to 1	16.4 to 1	16.4 to 1	16.4 to 1
Ratio—Overall	19.9 to 1	19.9 to 1	19.9 to 1	19.9 to 1
Minimum Turning Radius	20½ ft.	20½ ft.	21½ ft.	21½ ft.

TORSION-LEVEL SUSPENSION

Make	Packard	Packard	Packard	Packard
Type	Full Length Torsion Bar	Full Length Torsion Bar	Full Length Torsion Bar	Full Length Torsion Bar
Spring (Front)	Main Torsion Bar	Main Torsion Bar	Main Torsion Bar	Main Torsion Bar
Material	Silico-Manganese Steel	Silico-Manganese Steel	Silico-Manganese Steel	Silico-Manganese Steel
Torsion Bar (Long)	Main Suspension	Main Suspension	Main Suspension	Main Suspension
—Size	106" x 1"	106" x 1"	111" x 1"	111" x 1"
Torsion Bar (Short)	Load Compensator	Load Compensator	Load Compensator	Load Compensator
—Size	46⅛" x 25/32"	46⅛" x 25/32"	51" x 13/16"	51" x 13/16"
Spring (Rear)	Main Torsion Bar	Main Torsion Bar	Main Torsion Bar	Main Torsion Bar
Shock Absorber	Direct Acting 1" Dia.	Direct Acting 1" Dia.	Direct Acting 1" Dia.	Direct Acting 1" Dia.
Stabilizer—Front	Torsional	Torsional	Torsional	Torsional
Stabilizer—Rear	2-Link Type Torsional	2-Link Type Torsional	2-Link Type Torsional	2-Link Type Torsional
Load Compensator Control	Electric—Automatic	Electric—Automatic	Electric—Automatic	Electric—Automatic

TRANSMISSION

Type						
Standard	Selective—Silent Synchronized		Selective—Silent Synchronized			
Overdirve	Sp. Equipment		Sp. Equipment			
Ultramatic	Sp. Equipment		Sp. Equipment		Std. Equipment	Std. Equipment
Transmission Ratios	STD. O.D. ULTRA. .722 to 1		STD. O.D. ULTRA. .722 to 1		ULTRAMATIC	ULTRAMATIC
Direct	1 to 1	1 to 1	1 to 1	1 to 1	1 to 1	1 to 1
Second	1.58 to 1		1.58 to 1			
Low	2.49 to 1	1.82 to 1	2.49 to 1	1.82 to 1	1.82 to 1	1.82 to 1
Reverse	3.15 to 1	1.63 to 1	3.15 to 1	1.63 to 1	1.63 to 1	1.63 to 1
Oil Capacity—Std. Trans	3¼ Pints		3¼ Pints			
Oil Capacity—Overdrive Unit	1¼ Pints		1¼ Pints			
Oil Capacity—Automatic	11 qts.		11 qts.		11 qts.	11 qts.
Gear Tooth—Std. Trans	Helical		Helical			
Oil Level Plugs—Std. & O.D.	½" Pipe		½" Pipe			
Oil Level Indicator—Automatic	Filler Cap Dip Stick Right Side—Under Hood		Filler Cap Dip Stick Right Side—Under Hood		Filler Cap Dip Stick Right Side—Under Hood	Filler Cap Dip Stick Right Side—Under Hood

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WHEELS				
Type	Demountable Disc (15" x 5½" "K" Rim)	Demountable Disc (15" x 5½" "K" Rim)	Demountable Disc (15" x 6" "L" Rim)	Demountable Disc (15" x 6" "L" Rim)
Tire Size	760 x 15	760 x 15	800 x 15	800 x 15
Wheel Rev. Per Mile	731	731	717	717
Recommended Tire Pressure				
—Cold—Front	24 lbs.	24 lbs.	24 lbs.	24 lbs.
—Rear	24 lbs.	24 lbs.	24 lbs.	24 lbs.
For loads in excess of four passengers				
—Cold—Front	26 lbs.	26 lbs.	26 lbs.	26 lbs.
—Rear	26 lbs.	26 lbs.	26 lbs.	26 lbs.
CAR DIMENSIONS				
Wheel Base	122"	122"	127"	127"
Overall Length—Bumper to Bumper	215 11/32"	215 11/32"	218 41/64"	218 41/64"
Overall Height—Loaded	62" (Sedan)	62" (Sedan)	62.3" (Sedan)	61.7"
Overall Width	78"	78"	78"	78"

56TH SERIES CHASSIS AND BODY SYMBOLS

		CLIPPER			PACKARD	
		DELUXE	SUPER	CUSTOM		
		352 Cu. In. 240 HP 2 BBL.		352 Cu. In. 275 HP 4 BBL.	374 Cu. In. 290 HP 4 BBL.	374 Cu. In. 310 HP Two-4 BBL.
CHASSIS SYMBOLS		5640		5660	5680	5688
BODY TYPES	Pass.					
SEDAN—4 DOOR	6	5622	5642	5662	5682	
HARD TOP—2 DOOR	6		5647	5667	5687	5697
CONVERTIBLE	6					5699
WHEEL BASE		122"			127"	
OVERALL LENGTH		214¾" Approx.			218½" Approx.	

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